CLAIMS

1. A method of delivering a protein to a macrophage cell or a cell of macrophage derived lineage of an individual comprising the step of:

administering to said individual at a site on said individual's body, a DNA molecule comprising a nucleotide sequence that encodes said protein operably linked to a promoter and a polyadenylation signal that are functional in a macrophage cell and/or a cell of macrophage derived lineage, wherein said DNA molecule is taken up by a macrophage cell and/or a cell of macrophage derived lineage where said nucleotide sequence is expressed to produce said protein in said macrophage cell and/or said cell of macrophage derived lineage.

SUB A1

2. The method of claim 1 wherein said DNA molecule is administered by a route of administration selected from the group consisting of: intradermal, subcutaneous, intraperitoneal, intramuscular, and oral.

3. The method of claim 1 wherein said DNA molecule is a plasmid.

4. The method of claim 1 wherein said promoter is a macrophage promoter.

5. The method of claim 1 wherein said promoter is selected form the group consisting of: an actin promoter, a CD11 promoter, a CD13 promoter, an MHC-I promoter, an MHC-II promoter, a CD25 promoter, a CD80 promoter, a CD86 promoter, a catalase promoter, a CD156 promoter, an M-CSFR promoter, a p73 promoter, an FcγRI promoter, a CMV promoter, an actin promoter, an SV40 promoter and a Malony virus promoter.

SUB A2

6. The method of claim 1 wherein said polyadenylation signal is selected from the group consisting of: an SV40 polyadenylation signal and a bovine growth hormone polyadenylation signal.

7. The method of claim 1 wherein said DNA molecule is administered with a composition which facilitates uptake of said DNA molecule by a cell.

8. The method of claim 1 wherein said DNA molecule is administered with bupivacaine.

9. A method of delivering a protein to a lymphnode of an individual comprising the steps of:

SUB A3

a) locating a site on said individual's body that is proximal to said lymphnode;

b) administering to said individual at said site, a DNA molecule comprising a nucleotide sequence that encodes said protein operably linked to a promoter and a polyadenylation signal that are functional in a macrophage cell and/or a cell of macrophage derived lineage,

wherein said DNA molecule is taken up by a macrophage cell and/or a cell of macrophage derived lineage where said nucleotide sequence is expressed to produce said protein in said macrophage cell and/or said cell of macrophage derived lineage, and

said macrophage cell and/or said cell of macrophage derived lineage drains to said lymphnode, and delivers said protein in said lymphnode.

10. The method of claim 9 wherein said DNA molecule is administered by a route of administration selected from the group consisting of: intradermal, subcutaneous, intraperitoneal, intramuscular, and oral.

11. The method of claim 9 wherein said DNA molecule is a plasmid.

12. The method of claim 9 wherein said promoter is a macrophage promoter.

13. The method of claim 9 wherein said promoter is selected form the group consisting of: an actin promoter, a CD11 promoter, a CD13 promoter, an MHC-I promoter, an MHC-II promoter, a CD25 promoter, a CD80 promoter, a CD86 promoter, a catalase promoter, a CD156 promoter, an M-CSFR promoter, a p73 promoter, an FcγRI promoter, a CMV promoter, an actin promoter, an SV40 promoter and a Malony virus promoter.

14. The method of claim 9 wherein said polyadenylation signal is selected from the group consisting of: an SV40 polyadenylation signal and a bovine growth hormone polyadenylation signal.

15. The method of claim 9 wherein said DNA molecule is administered with a composition which facilitates uptake of said DNA molecule by a cell.

16. The method of claim 9 wherein said DNA molecule is administered with bupivacaine.

17. The method of claim 9 wherein said protein comprises a secretion signal sequence.

18. A method of inducing an immune against an immunogen an individual comprising the step of:

administering to said individual at a site on said individual's body, a DNA molecule comprising a nucleotide sequence that encodes said immunogen operably linked to a promoter and a polyadenylation signal that are functional in macrophage cells and/or cells of macrophage derived lineages,

wherein said DNA molecule is taken up by a macrophage cell and/or a cell of macrophage derived lineage where said nucleotide sequence is expressed to produce said immunogen in said macrophage cell and/or said cell of macrophage derived lineage and an immune response mediated by said macrophage is generated against said immunogen.

SUB A4

19. The method of claim 18 wherein said DNA molecule further comprises

a nucleotide sequence that encodes an immunomodulating protein operably linked to a promoter and a polyadenylation signal that are functional in macrophage cells and/or cells of macrophage derived lineages, and/or

a second DNA molecule is additionally administered to said site on said individual's body, said second DNA molecule comprising a nucleotide sequence that encodes an immunomodulating protein operably linked to a promoter that is functional in macrophage cells and/or cells of macrophage derived lineages and a polyadenylation signal that is functional in macrophage cells and/or cells of macrophage derived lineages.

20. The method of claim 18 wherein said immune response targets a pathogen.

21. The method of claim 18 wherein said immune response is a protective immune response.

22. The method of claim 18 wherein said immune response is a therapeutic immune response.

23. A method of modulating an individual's immune system comprising the step of:

administering to said individual at a site on said individual's body, a DNA molecule comprising a nucleotide sequence that encodes an immunomodulating protein operably linked to a promoter and a polyadenylation signal that are functional in a macrophage cell and/or a cell of macrophage derived lineage,

wherein said DNA molecule is taken up by a macrophage cell and/or a cell of macrophage derived lineage where said nucleotide sequence is expressed to produce said immunomodulating protein in said macrophage cell and/or a cell of macrophage derived lineage and said immunomodulating protein modulates said individual's immune system.

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24. The method of claim 23 wherein said DNA molecule further comprises

a nucleotide sequence that encodes an immunomodulating protein operably linked to a promoter and a polyadenylation signal that are functional in macrophage cells and/or cells of macrophage derived lineages and/or

a second DNA molecule is additionally administered to said site on said individual's body, said second DNA molecule comprising a nucleotide sequence that encodes an immunomodulating protein operably linked to a promoter that is functional in macrophage cells and/or cells of macrophage derived lineages and a polyadenylation signal that is functional in macrophage cells and/or cells of macrophage derived lineages.

SUB A5

25. 25. A method of eliminating cells in a lymphnode of an individual comprising the step of:

administering to said individual at a site on said individual's body proximal to a lymphnode, a DNA molecule comprising a nucleotide sequence that encodes a cytotoxic protein operably linked to promoter and a polyadenylation signal that are functional in macrophage cells and/or cells of macrophage derived lineages,

wherein said DNA molecule is taken up by macrophage cells and/or cells of macrophage derived lineages where said nucleotide sequence is expressed to produce said protein in said macrophage cells and/or said cells of macrophage derived lineage,

said macrophage cell and/or a cell of macrophage derived lineage drains to said lymphnode, and said macrophage cell and/or a cell of macrophage derived lineage secretes or releases said cytotoxic protein in said lymph node eliminating cells in said lymphnode.

SUB AS CONT

26. The method of claim 25 wherein said protein comprises a secretion signal sequence.

27. The method of claim 25 wherein said protein is a toxin.

28. The method of claim 25 wherein said protein is ricin A chain or diphtheria toxin.

29. A method of delivering a desired protein to an individual comprising the step of:

administering to said individual at a site on said individual's body, a DNA molecule comprising a nucleotide sequence that encodes said desired protein operably linked to a promoter and a polyadenylation signal that are functional in a macrophage cell and/or a cell of macrophage derived lineage,

SUB A6

wherein said DNA molecule is taken up by a macrophage cell and/or a cell of macrophage derived lineage where said nucleotide sequence is expressed to produce said desired protein in said macrophage cell and/or a cell of macrophage derived lineage.

ADD A7

INS A9